FIG. 1

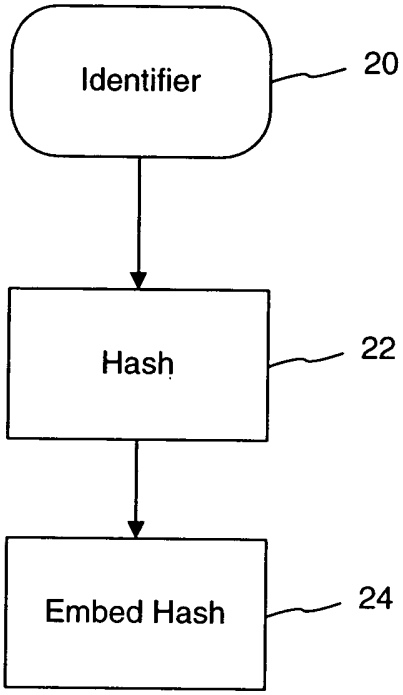

Identifier
20
Hash
22
Embed Hash
24

FIG. 2

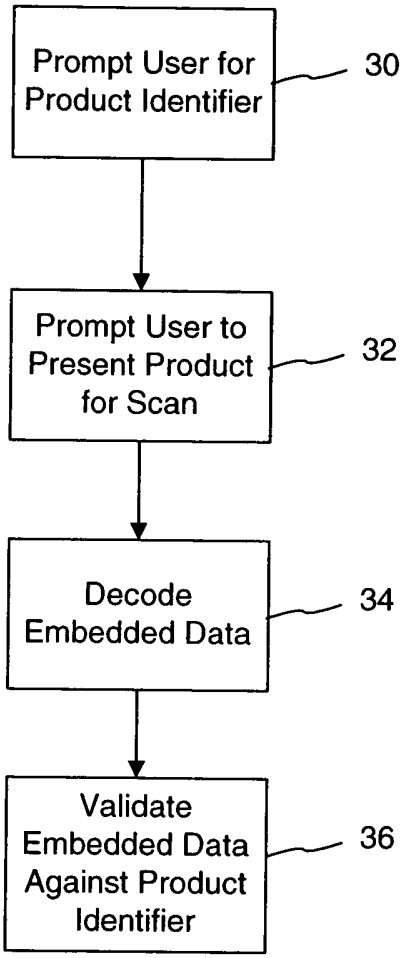
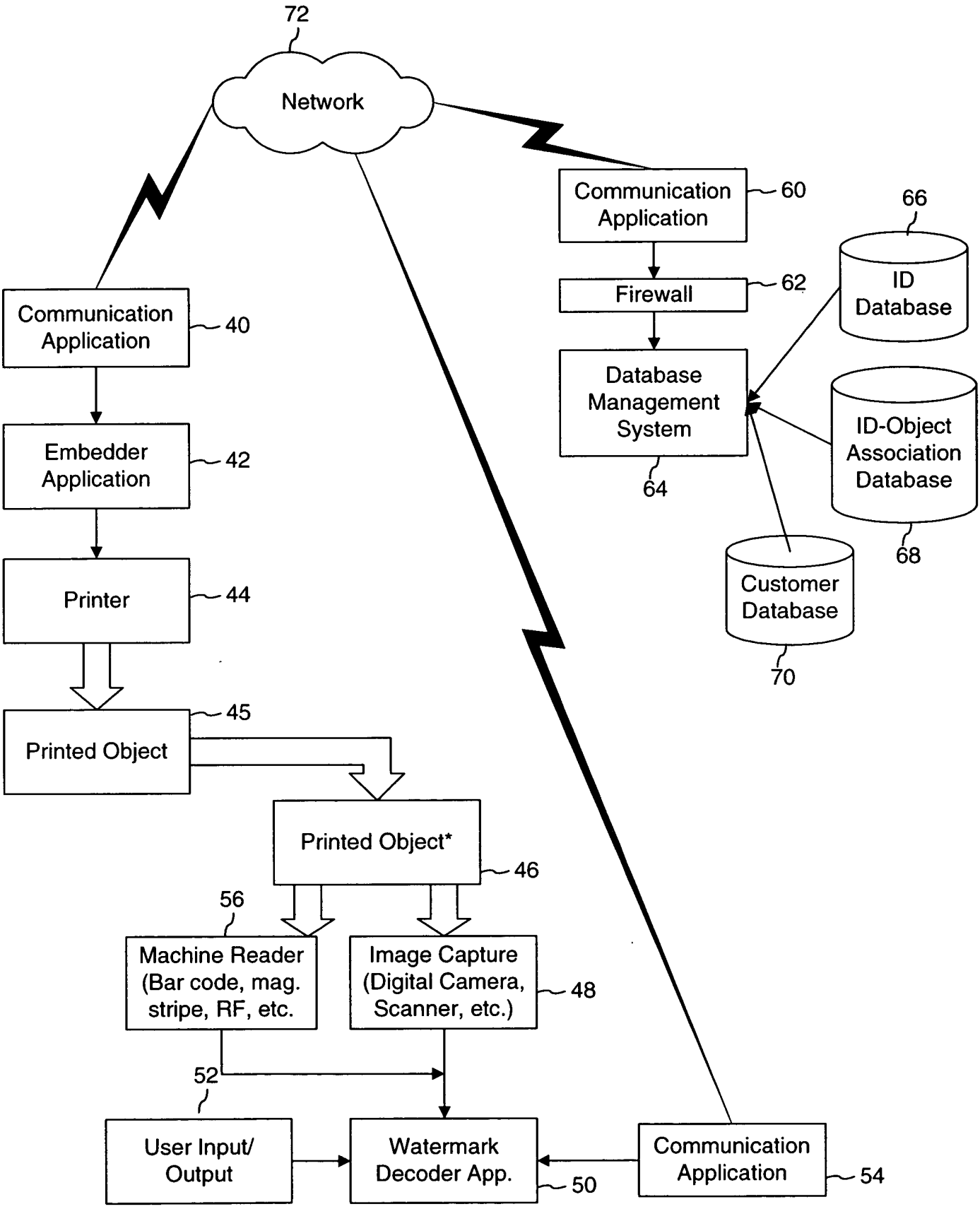

Prompt User for Product Identifier
30
Prompt User to Present Product for Scan
32
Decode Embedded Data
34
Validate Embedded Data Against Product Identifier
36

FIG. 3


72
Network
Communication Application
60
66
ID Database
Firewall
62
Communication Application
40
Database Management System
64
ID-Object Association Database
68
Embedder Application
42
Customer Database
70
Printer
44
Printed Object
45
Printed Object*
46
56
Machine Reader (Bar code, mag. stripe, RF, etc.
Image Capture (Digital Camera, Scanner, etc.)
48
52
User Input/ Output
Watermark Decoder App.
50
Communication Application
54

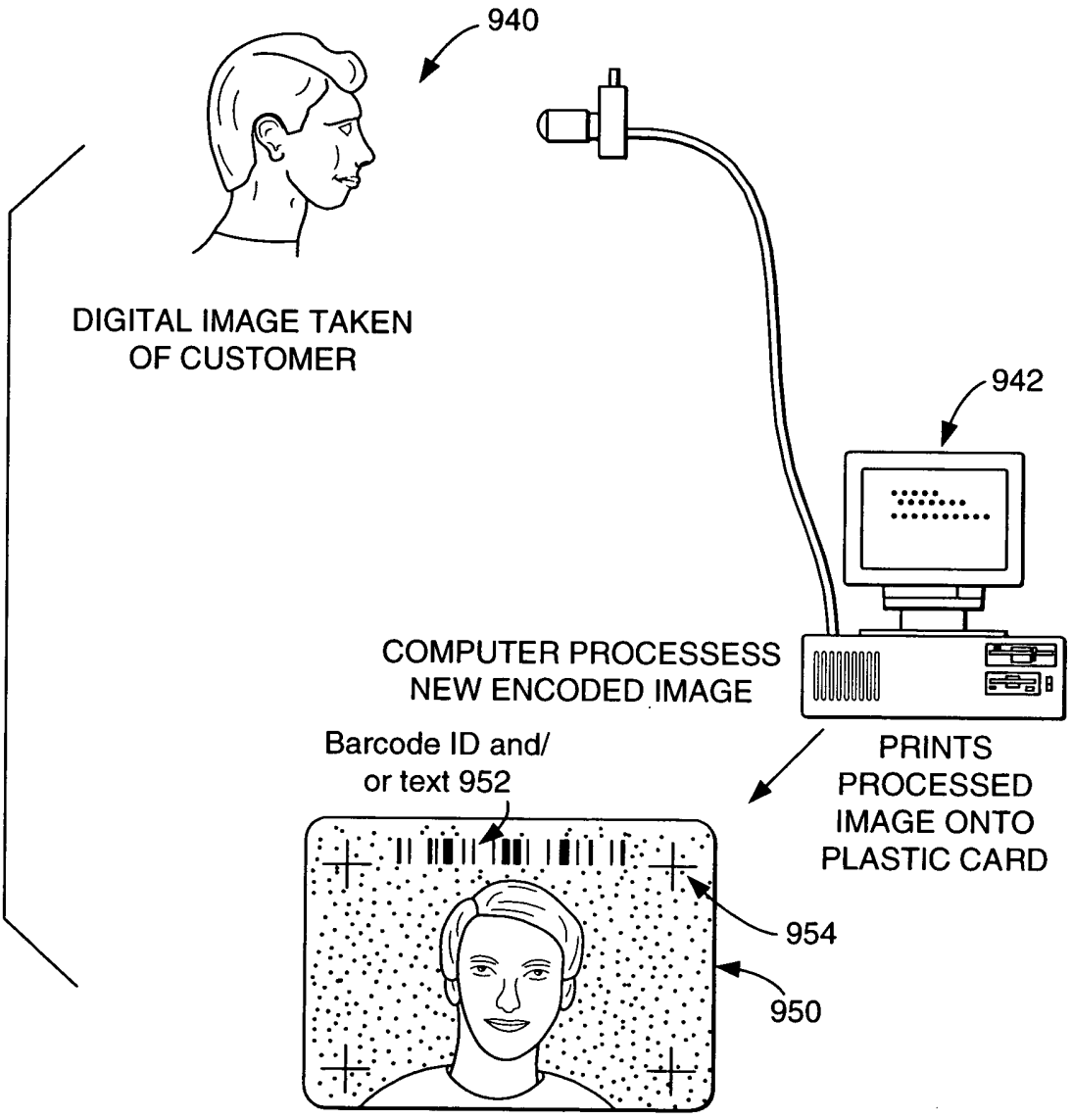
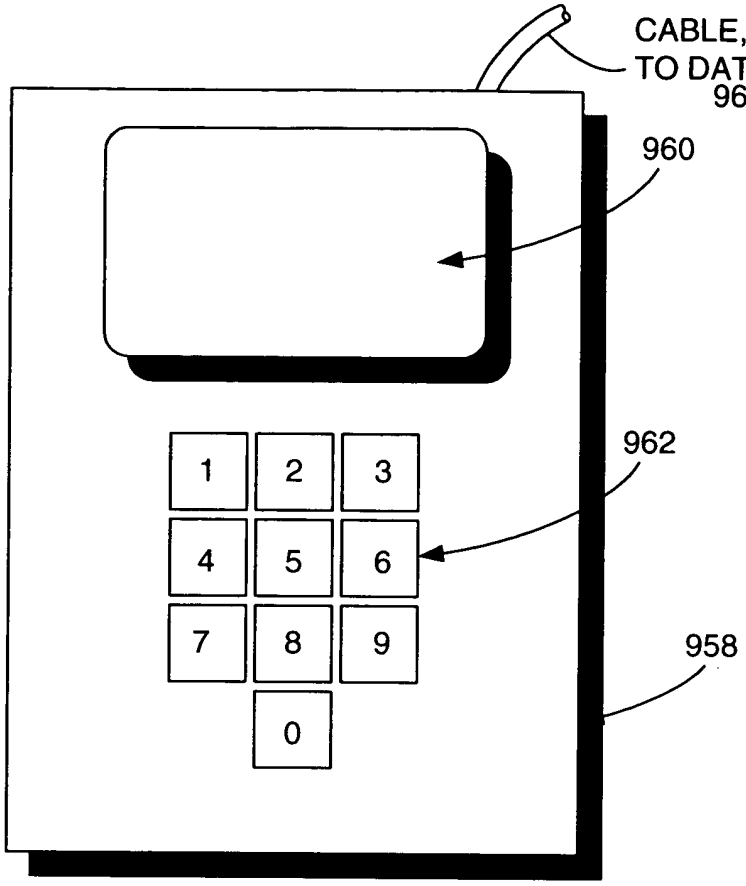

940
DIGITAL IMAGE TAKEN
OF CUSTOMER
942
COMPUTER PROCESSESS
NEW ENCODED IMAGE
Barcode ID and/
or text 952
PRINTS
PROCESSED
IMAGE ONTO
PLASTIC CARD
954
950

FIG. 4




CONTAINS RUDIMENTARY OPTICAL SCANNER, MEMORY BUFFERS, COMMUNICATIONS DEVICES, AND MICROPROCESSOR

CONSUMER MERELY PLACES CARD INTO WINDOW AND CAN, AT THEIR PREARRANGED OPTION, EITHER TYPE IN A PERSONAL IDENTIFICATION NUMBER (PIN, FOR ADDED SECURITY) OR NOT. THE TRANSACTION IS APPROVED OR DISAPPROVED WITHIN SECONDS.

FIG. 5

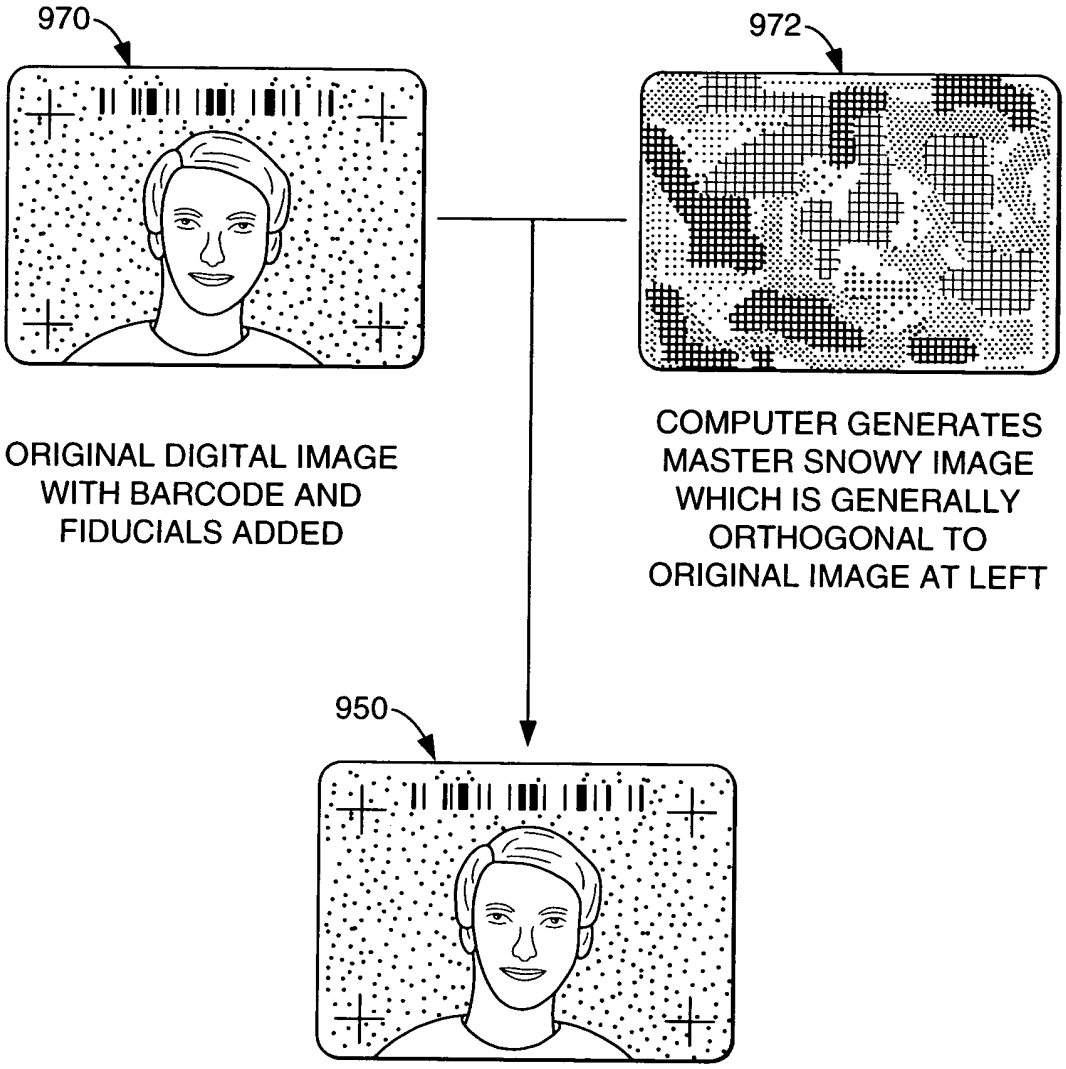

970
972
ORIGINAL DIGITAL IMAGE WITH BARCODE AND FIDUCIALS ADDED
COMPUTER GENERATES MASTER SNOWY IMAGE WHICH IS GENERALLY ORTHOGONAL TO ORIGINAL IMAGE AT LEFT
950
COMBINED TO FORM PERSONAL CASH CARD

FIG. 6

## TYPICAL TRANSACTION STEPS

1. READER SCANS IMAGE ON CARD, STORES IN MEMORY, EXTRACTS PERSON'S ID
2. OPTIONAL: USER KEYS IN PIN NUMBER
3. READER CALLS CENTRAL ACCOUNT DATA NETWORK, HANDSHAKES
4. READER SENDS ID, (PIN), MERCHANT INFORMATION, AND REQUESTED TRANSACTION AMOUNT TO CENTRAL NETWORK
5. CENTRAL NETWORK VERIFIES ID, PIN, MERCHANT INFO, AND ACCOUNT BALANCE
6. IF OK, CENTRAL NETWORK GENERATES TWENTY-FOUR SETS OF SIXTEEN DISTINCT RANDOM NUMBERS, WHERE THE RANDOM NUMBERS ARE INDEXES TO A SET OF 64K ORTHOGONAL SPATIAL PATTERNS
7. CENTRAL NETWORK TRANSMITS FIRST OK, AND THE SETS OF RANDOM NUMBERS
8. READER STEPS THROUGH THE TWENTY-FOUR SETS

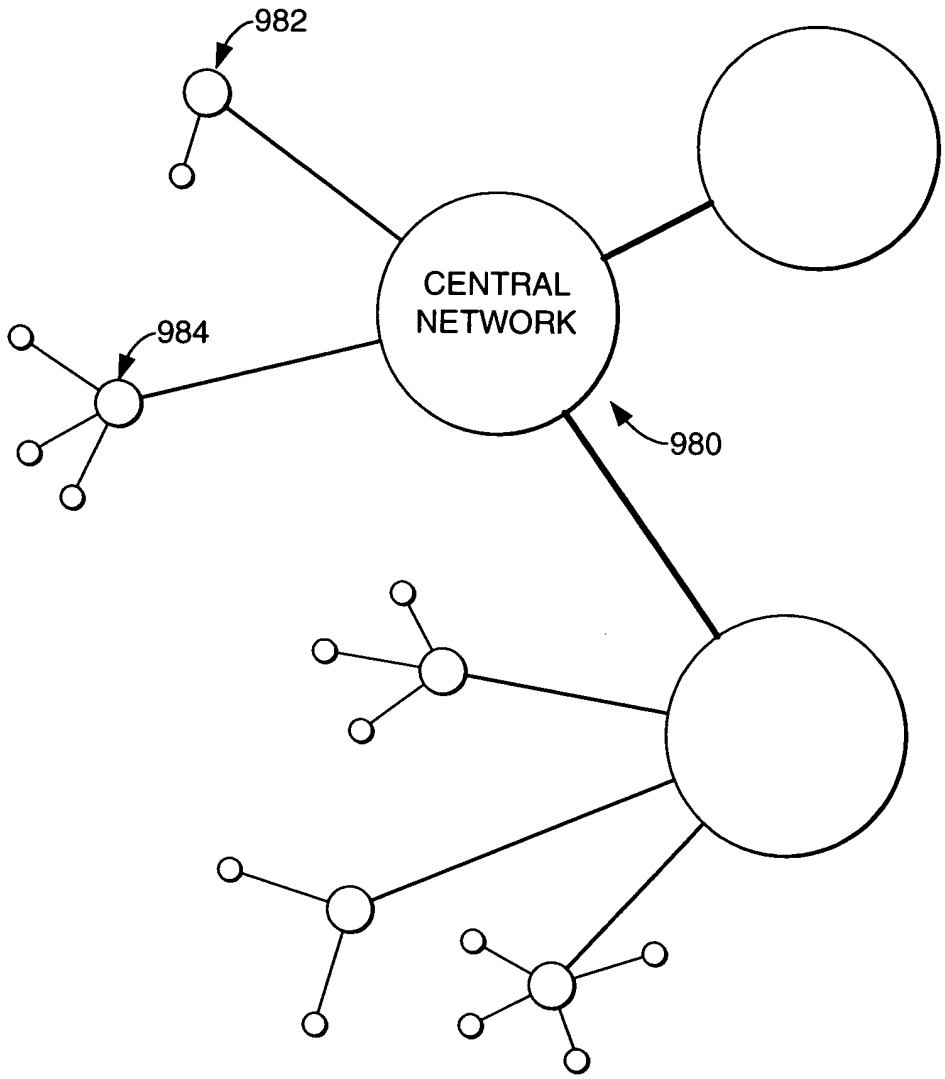
8A. READER ADDS TOGETHER SET OF ORTHOGONAL PATTERNS

8B. READER PERFORMS DOT PRODUCT OF RESULTANT PATTERN AND CARD SCAN, STORES RESULT

9. READER TRANSMITS THE TWENTY-FOUR DOT PRODUCT RESULTS TO CENTRAL NETWORK
10. CENTRAL NETWORK CHECKS RESULTS AGAINST MASTER
11. CENTRAL NETWORK SENDS FINAL APPROVAL OR DENIAL
12. CENTRAL NETWORK DEBITS MERCHANT ACCOUNT, CREDITS CARD ACCOUNT

FIG. 7

THE NEGLIGIBLE-FRAUD CASH CARD SYSTEM




A BASIC FOUNDATION OF THE CASH CARD SYSTEM IS A 24-HOUR INFORMATION NETWORK, WHERE BOTH THE STATIONS WHICH CREATE THE PPHYSICAL CASH CARDS, 950, AND THE POINT-OF-SALES, 984, ARE ALL HOOKED UP TO THE SAME NETWORK CONTINUOUSLY

FIG. 8

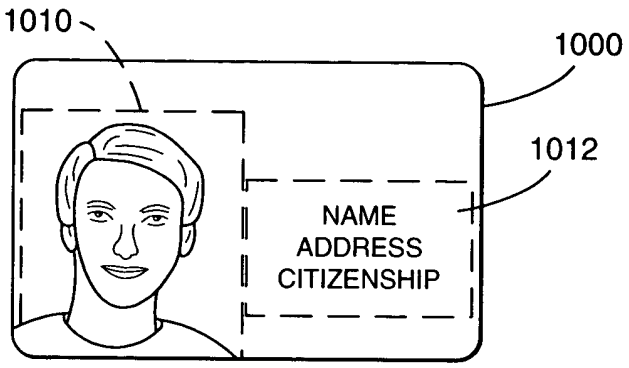



FIG. 9

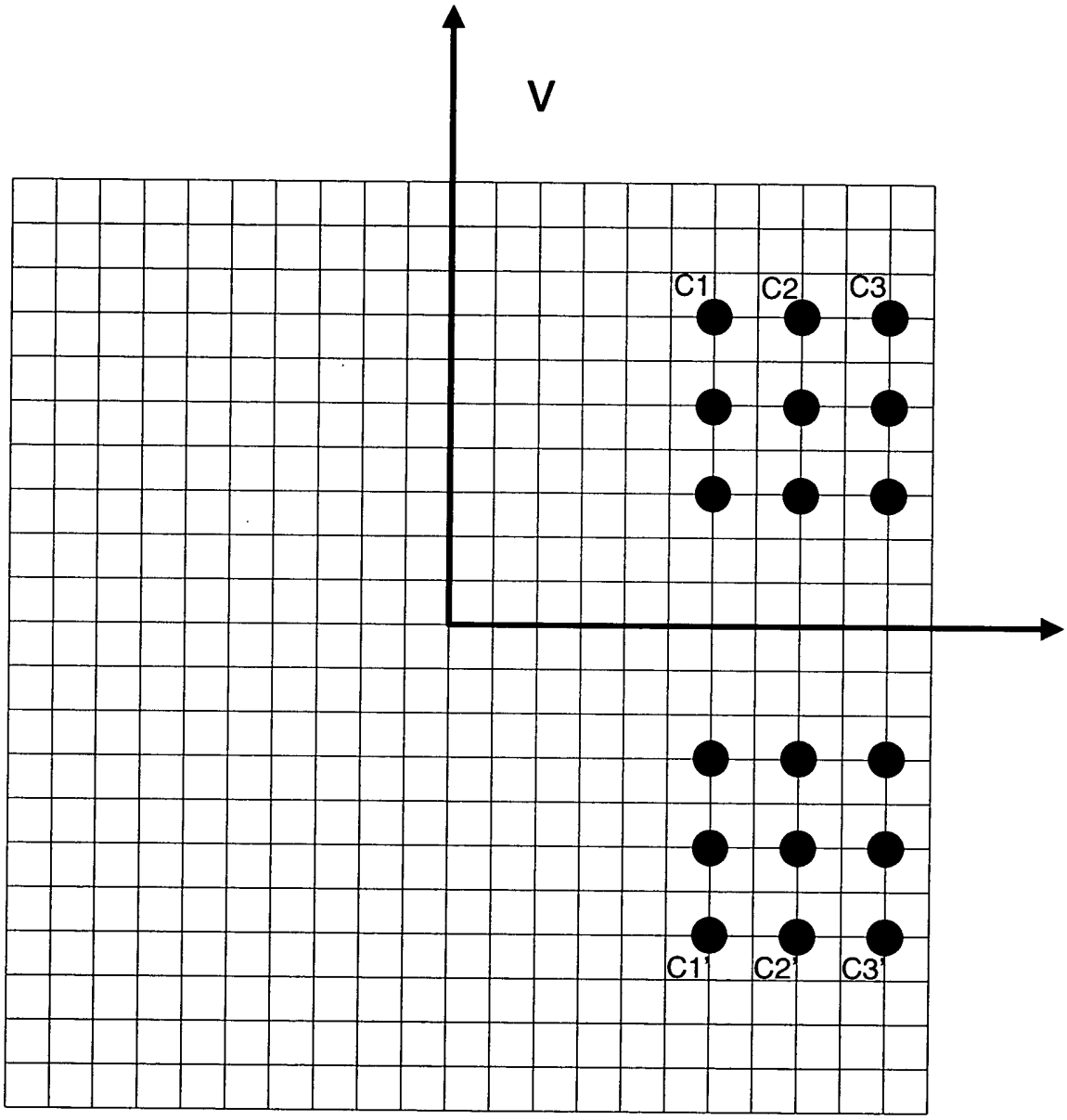
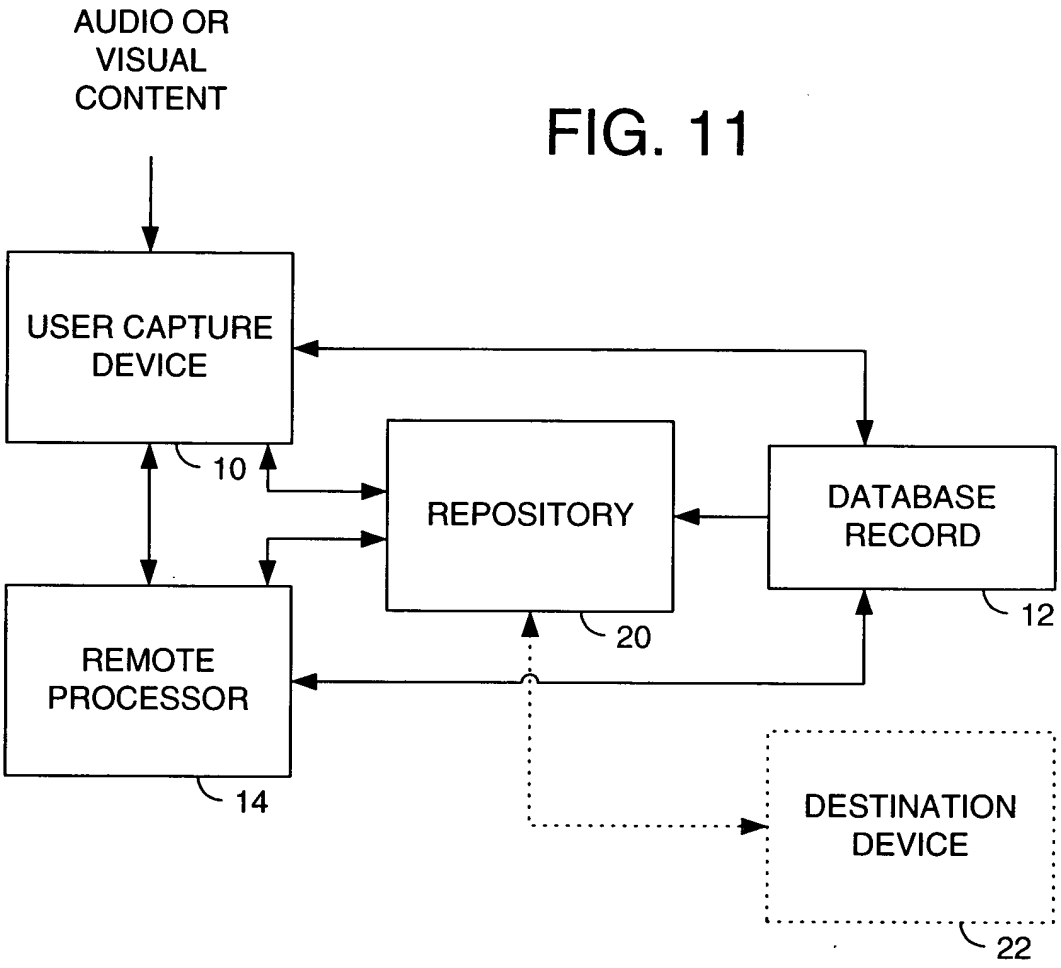



FIG. 10

FIG. 11


AUDIO OR VISUAL CONTENT
USER CAPTURE DEVICE
10
REPOSITORY
20
DATABASE RECORD
12
REMOTE PROCESSOR
14
DESTINATION DEVICE
22

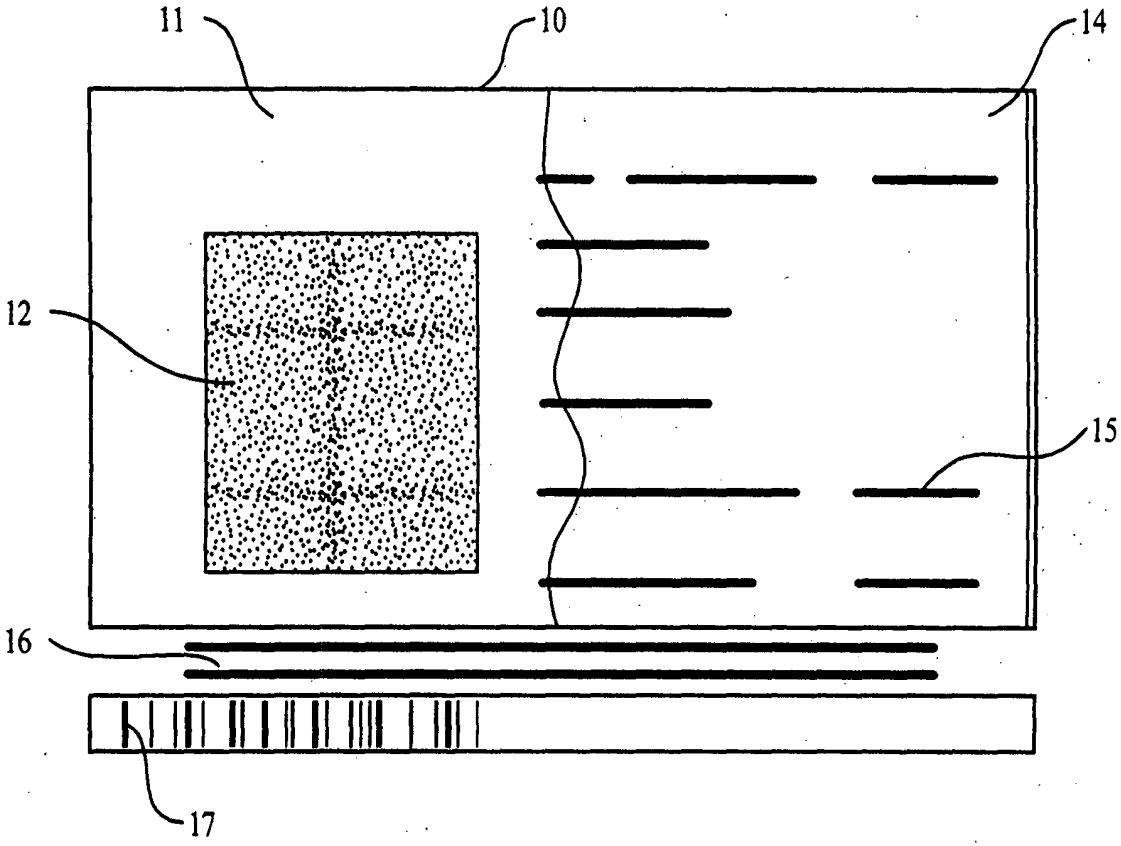



FIG. 12

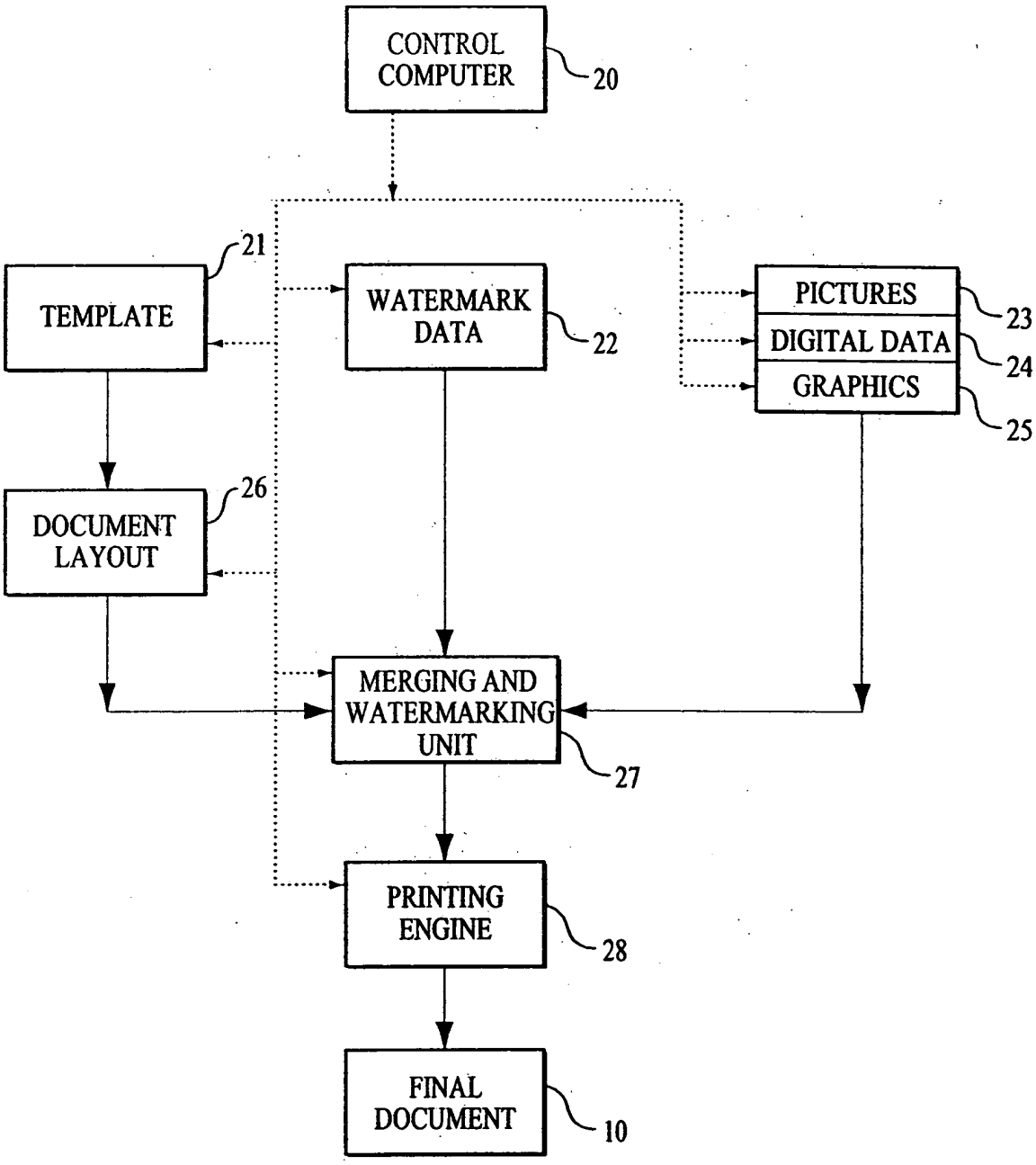

CONTROL COMPUTER
20
TEMPLATE
21
WATERMARK DATA
22
PICTURES
23
DIGITAL DATA
24
GRAPHICS
25
DOCUMENT LAYOUT
26
MERGING AND WATERMARKING UNIT
27
PRINTING ENGINE
28
FINAL DOCUMENT
10

FIG. 13

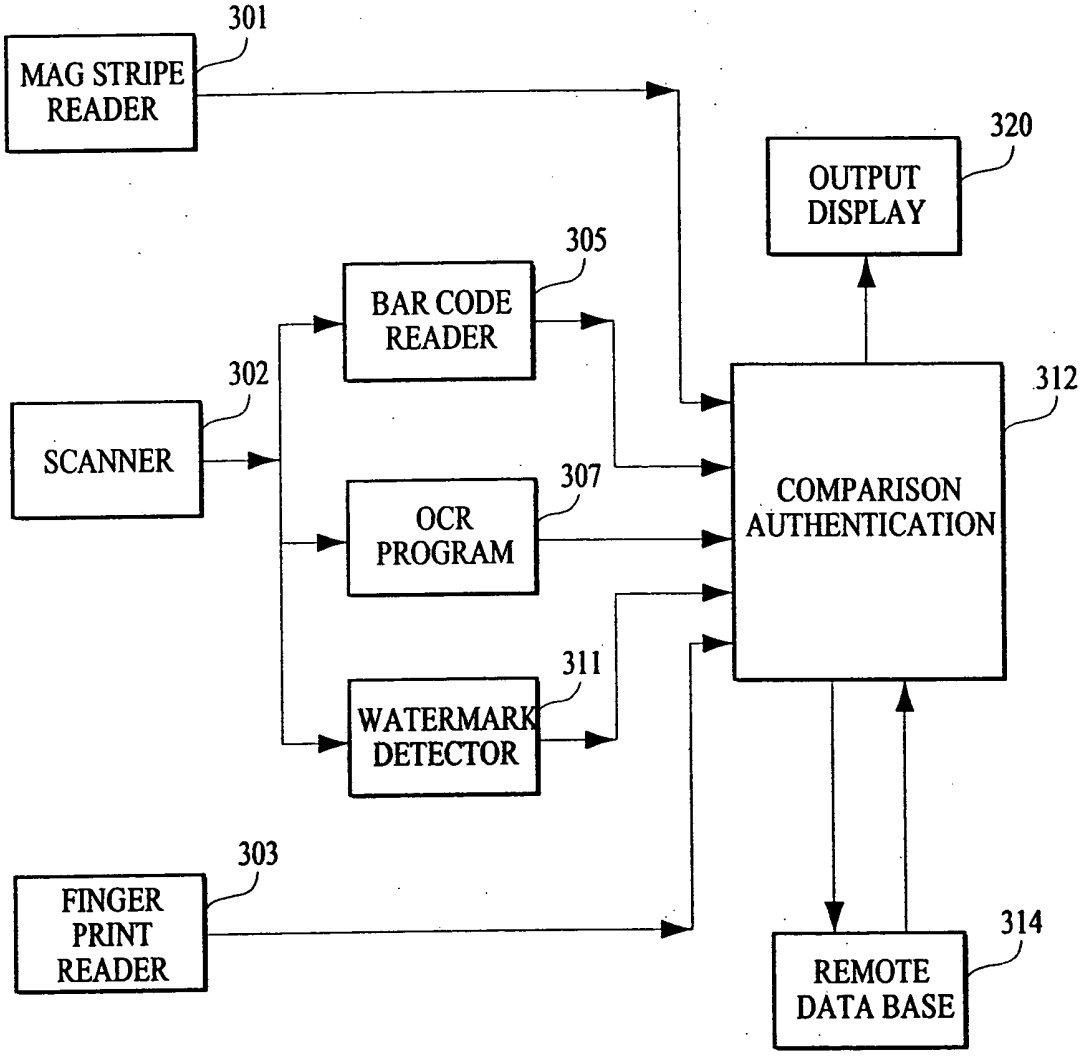

301
MAG STRIPE READER
320
OUTPUT DISPLAY
305
BAR CODE READER
302
SCANNER
312
COMPARISON AUTHENTICATION
307
OCR PROGRAM
311
WATERMARK DETECTOR
303
FINGER PRINT READER
314
REMOTE DATA BASE

FIG. 14

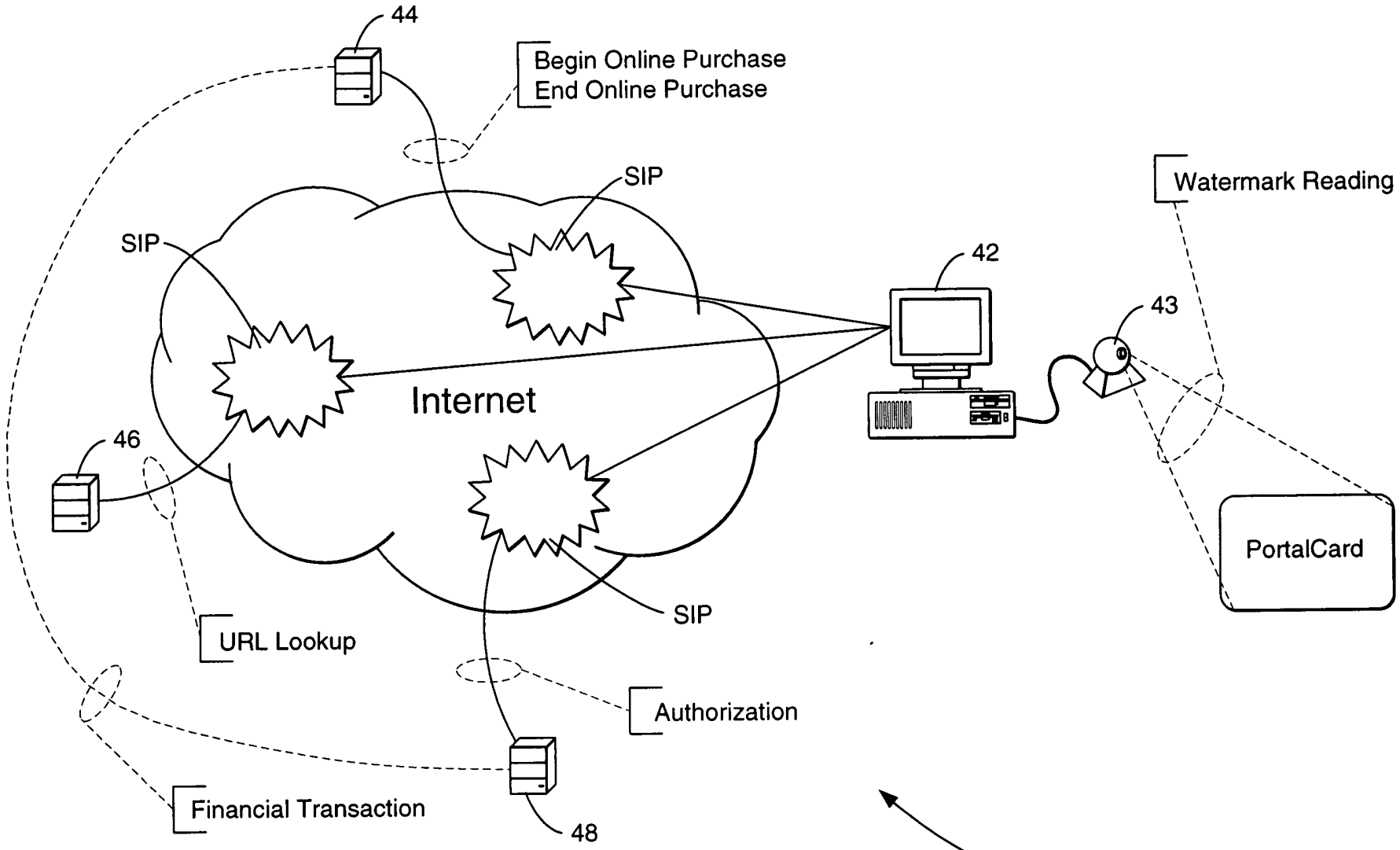

44
Begin Online Purchase
End Online Purchase
SIP
SIP
Internet
SIP
42
43
Watermark Reading
PortalCard
46
URL Lookup
Authorization
Financial Transaction
48
40

FIG. 15

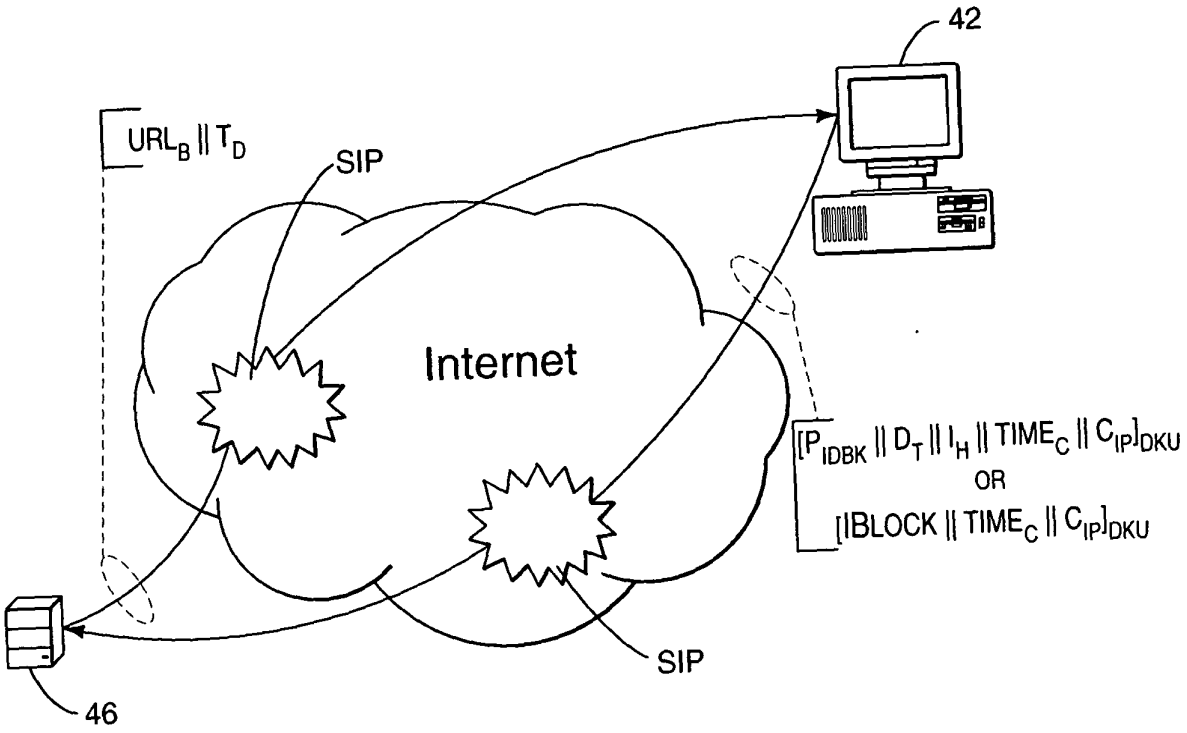

42
$URL_B \| T_D$
SIP
Internet
$[P_{IDBK} \| D_T \| I_H \| TIME_C \| C_{IP}]_{DKU}$
OR
$[IBLOCK \| TIME_C \| C_{IP}]_{DKU}$
SIP
46

FIG. 16